Small Business Innovation Research/Small Business Tech Transfer

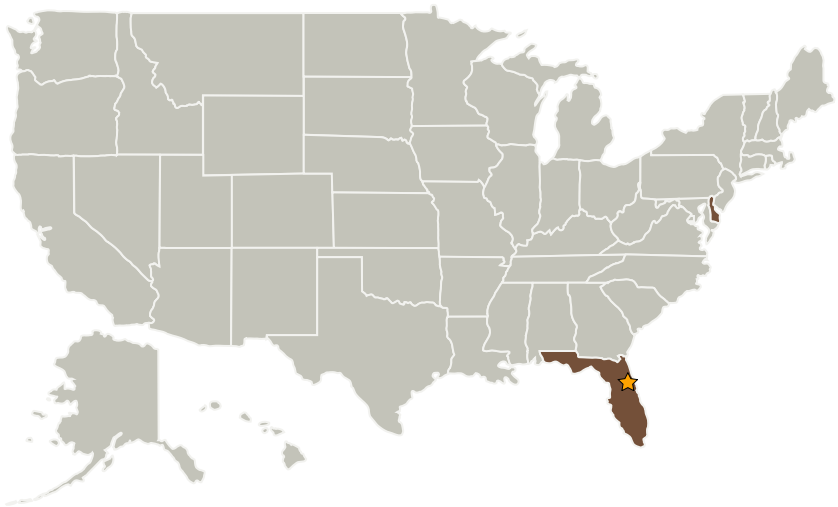
Processor for Real-Time Atmospheric Compensation in Long-Range Imaging, Phase II

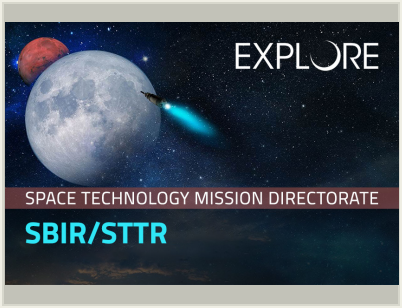
Completed Technology Project (2007 - 2009)

Project Introduction

Long-range imaging is a critical component to many NASA applications including range surveillance, launch tracking, and astronomical observation. However, significant degradation occurs when imaging through the Earth's atmosphere. The subsequent effects of poor image quality range from inconvenient to dangerous depending on the application. In Phase I, EM Photonics developed a prototype solver based on field-programmable gate array (FPGA) technology capable of enhancing long-range images and videos by compensating for atmosphere induced distortions. This solver was built on an FPGA-platform and thus offered a significant performance increase over traditional, software-based approaches. In Phase II, we will extend this prototype to process incoming video streams in real-time for a variety of formats, including the high-definition version used by NASA. The resulting device will be light-weight and low-power and can be integrated with current video collection, viewing, and recording equipment. This device can be used to process data as it is collected (in real-time) or from previously recorded imagery and deployed with camera systems or in data centers depending on the application. Additionally, since this processing unit is built on FPGA technology, it can easily be extended to perform a variety of other tasks such as compression, encryption or further processing.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
EM Photonics, Inc.	Supporting Organization	Industry	Newark, Delaware

Primary U.S. Work Locations	
Delaware	Florida

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.3 Optical Components